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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Annual General Meeting of the South Travancore Planters' Association and as regards 'Labour' this Association is strongly opposed to any legislation at present.

We have been favoured with another very interesting letter from Mr. Harris on 'Explosives' as an aid to Agriculture. It will be noted that from the experiments witnessed by him he is of opinion that the cost given in his first letter of January 25th may be excessive. We hope that others will make experiments and give us the benefit of them. It is very pleasant to think that those who retire still take an interest in our industries and communicate widely their experiments. We wish others would do the same.

Green manuring has been so widely advocated in the first instance by Dr. Lehmann, the Agricultural Chemist of the Government of Mysore, and later strongly recommended by the Scientific Officer of this Association that any article tending to support their views must be of great interest to the Planting Community: so an article is reproduced.

Many members of the Planting Community go home so frequently now-a-days that that it will interest all—those who go and those who stay—that for a subscription of one pound they can have the use of a Reading and Writing Room at the Imperial Institute and can make use of the Government Library and Reading Room while at home. We publish the Government Notification on the subject and would draw our readers' special attention to it.

An interesting lecture by Dr. Chandler on the "Economic of the Tea Trade" will interest Tea Planters.

We hope to welcome Mr. Anstead, Scientific Officer, back to Headquarters by the end of the month. He will find the climate of Bangalore different to that of the High Range. Bangalore is at present one degree hotter than Madras which is 93. Bangalore 94.

A very useful table called The Bankers' and Merchants' Time Table has been received at the Office. It is most useful and effects and enormous saving of time for ascertaining the number of days between any two dates in a year, due dates, etc. A useful adjunct to every office table.

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the Annual General Meeting held at the Club in Quilon on Saturday, 22nd February, 1913.

PRESENT.—Mr. J. B. Cook (in the Chair), Messrs. R. Branson, L. G. Knight, J. H. Parkinson, C. Hall, H. S. K. Morrell, T. S. Jackson, and A. W. Leslie, (Honorary Secretary). *By Proxy*:—Messrs. J. Stewart and S. W. Sinclair.

In the absence of Mr. Stewart, Mr. J. B. Cook was voted to the chair.

Agenda Paper:—

1. Confirm Minutes of last meeting.
2. Chairman's Report for the past year.
3. Adoption of Accounts.
4. Report on the Sri-Mulam Assembly.
5. Mr. Cook's Resolution, *re* meetings of this Association.
6. Labour Legislation.
7. Cooly Rates.
8. Correspondence.
9. Election of Office-bearers for 1913.

The Minutes of the previous Meeting were read and confirmed. A letter was read from Mr. J. Stewart, the Chairman, regretting his inability to attend the meeting, and on retiring from the chair, thanked all members for the support they had given him in the past.

The next business was the adoption of the Accounts. A statement of these was read by the Honorary Secretary and passed.

Sri Mulam Assembly.—The following report was read by our representive Mr. J. B. Cook.

"Gentlemen,—As instructed I attended the Sri Mulam Popular Assembly as your Delegate. The first subject you asked me to bring forward, was the question of present Estate owners being allowed to take up say 30% of the amount of their properties at the upset price without its being put up to auction. The Dewan replied that as far as possible present holders would have the preference over adjoining lands, but that the Government could not bind itself by a special rule.

"With reference to the European Ward at Quilon, this has been sanctioned, and the Bacteriological Office there is to be converted into a ward for Europeans and later on when the Railway reaches Trivandrum it is probable that another ward will be built at the capital.

"The Kanan Devan Delegate brought forward a subject as to the undersirability of any addition to the existing labour laws. The Dewan asked the opinion of the Central Travancore Delegate and myself on this. I said I had no instructions from my Association, and was not sure of their views; but gave as my own private opinion that some further legislation will have to come sooner or later: not so much against the labourer as against ourselves. Mr. Westaway the Central Travancore Delegate agreed with me, but he, like myself, had no instructions from his Association on the matter."

It was proposed by Mr. J. G. Coats that fixed dates be arranged for the meetings of this Association *viz.*—The Annual General Meeting to be held on the last Saturday in January, and the Quarterly Meetings on the last Saturdays in April, July and October, this was carried after the following amendment by Mr. L. G. Knight "unless circumstances render postponement necessary."

Labour Legislation.—Read letter dated 12th November, 1912 from Honorary Secretary, Central Travancore Planters' Association. After some discussion and the reading of several letters from our members it was resolved that this Association be strongly opposed to any legislation at present.

Cooly Rates.—This matter having been discussed it was decided to leave it over for future meetings.

The following resolutions were brought forward by Mr. L. H. Knight and carried.

1. "That the British Resident be requested to supply this Association with copies of all the regulations relating to the import of Fire arms into Travancore and the licenses required to keep and transport arms into and out of Travancore and the licenses required (if any) to shoot game."

2. "That the authorities be requested to consider the great necessity of retaining a Police Station at Aryankavoo, as a serious robbery took place on Ambanaad Estate on the 13th of this month and for various reasons, the Police were not able to reach the estate till 54 hours after the occurrence of the robbery."

Election of Office-bearers.—The following were elected for the ensuing year:—

Mr. E. Lord as Chairman

Mr. H. C. Seymour as Honorary Secretary, with Messrs. L. G. Knight, R. Ross, and H. S. K. Morrell as a Committee.

The rate of subscription to the Association was fixed at the same figure as last year *viz.*, annas 3 per cultivated acre.

It was decided to leave over the election of a delegate for Bangalore until next meeting.

This being all the business, the meeting closed with a vote of thanks to the Chair.

(Signed) A. W. LESLIE,
Honorary Secretary.

A note in the *International Sugar Journal* for December 1912, states that the exports of sugar from Peru in 1909 amounted to 125,351 tons, value £1,159,899. Most of this sugar went to Chile, while the United Kingdom was the second largest customer.—*The Agricultural News.*

Aluminium nitride has been referred to already in this journal (*Agricultural News*, Vol. IX, p. 188) as a possible manure. In Engrais, 1912 p.577, a discussion is given of the production of this substance as a practical means of fixing the nitrogen of the air. It is indicated that aluminium nitride may become useful in agriculture on accoount of the fact that it contains about one-third of its weight of nitrogen and that it can be produced fairly cheaply.—*The Agricultural News.*

CORRESPONDENCE.

Explosives as an aid to Agriculture.

To The Managing Editor,
The Planters' Chronicle.
Bangalore.

Dear Sir,—In continuation of my letter published in your issue of 25th January, it may interest some of your readers if I give a brief account of some experiments I recently witnessed on a neighbour's property.

No. 1. A piece of ground was being levelled for the purpose of making tennis lawns. At one end a cutting of 2½ feet had to be made, and the earth carried along and put at the other end. Instead of cutting the earth by means of manual labour explosives were used, and I was assured that three cartridges were put into a hole made with a crowbar about 2½ feet deep, at intervals of about 6 feet either way, and the holes were filled with earth, and rammed down, a fuse attached to a cartridge being left about a foot out of the ground. This was lit, we retreated to a safe distance, and in about 2 minutes the explosion took place. The report was not so loud as I anticipated, and the earth was not thrown up any distance, but it was thoroughly disintegrated, and in a state to be easily shovelled into the wheelbarrow.

No. 2. The next objective was the stump of a fair young oak measuring 4 to 5 feet in circumference at the base—a rough trench had been made round the stump and some of the lateral roots cut to give access underground for the insertion of the explosive. The cartridges, amounting altogether to 1¼ lb. of cheddite, were packed tight in a tin (the greater the compression the more effective the explosion) and the tin was shoved into a hole as near the centre of the stump as could be reached. It was then rammed tight, the fuse lit, and in a minute or two the explosion occurred. The report was louder this time, there being more resistance, but nothing was thrown any distance—on inspection we found that half the stump was blown clean out of the ground, and the foundations of the remaining half so shaken that removal by hand was no longer a matter of much difficulty.

No. 3. We next tackled a large elm stump which must have measured 9 to 10 feet in circumference, and which required 3 separate explosions to effectually uproot it. For the first 1½ lbs. of cheddite were rammed down, which blew a considerable portion out of the ground, and caused a general shattering—a second charge of about 1 lb. disposed of a good piece more, but a third was necessary, as what remained was still pretty firm in the ground. This was inserted in a very favourable position and in close contiguity to the stump itself. The result was a great commotion, chunks large and small flew in all directions, some 50 to 60 feet high, some to a distance of 30 or 40 yards. We had been inclined to think our host over cautious in insisting on our standing at what he considered a safe distance—this time we appreciated his care. The result of the experiments was pronounced very satisfactory, and the actual cost of the powder used said to be only about 3*s*, so it would look as if the estimate of cost given in my previous letter might be excessive. A few carefully conducted experiments would soon determine this. There is no doubt the work is most effectually done when explosives are used—and I think the system, in spite of cheap labour, might be resorted to in India in connection with some works with great advantage.

Yours faithfully,

27th February, 1912. J. A. Harris.

GREEN MANURING.

BY

G. D. HOPE, PH. D., B. Sc., F. C. S.

AND

A. C. TUNSTALL, B. Sc.

PART I.

The knowledge, use and value of green manuring have become so general and its results recognised as so beneficial that we have no hesitation in reproducing an article on the subject.

"Green manuring, that is, the growth of a crop not for the purpose of yielding a harvest, but in order to increase the fertility of land on which productive crops are also grown, either at the same time or in alternation with them, has been an important feature of agriculture for many hundreds of years.

It would be out of place here to go into the history of different methods of dealing with green manures, and we are concerned only with practical considerations bearing on their use.

Green crops are grown with two main objects :—

(a) to add *organic matter* to the soil.

(b) in the case of certain green crops to add nitrogen to the soil.

We will consider these in order :—

(a) The necessity for a supply of organic matter in the soil will be understood when it is explained that soil consists essentially of organic remains (chiefly of plants) mixed with weathered rock fragments, the whole being the medium for the activities of bacteria which, in their life processes, produce nutrient solutions which serve to support higher plant life.

No definite rule can be laid down as to the amount of organic matter that a soil should contain in order to be best suited to the requirements of tea bushes, for the amount of organic matter found in first class tea soils varies enormously. It is well known that healthy vigorous bushes can, and do, grow well, on the one hand in soils which contain as much as 60 per cent. or more of organic matter (wheel soils), and on the other in soils which contain as little as 3 per cent. and within these rough limits the amount of organic matter is no criterion of the quality of the soil. Speaking generally, however, bushes grow more vigorously and flush more readily the higher the percentage of organic matter in the soil, until a stage is reached at which they have a tendency to produce rank growth and poor quality of leaf, and are subject to blights. An example of this is afforded by tea growing in wheel soils. Those bushes which grow in soils deficient in organic matter are poor and stunted and lack vigour a condition which is probably detrimental to the quality of the leaf.

The general tendency of the soils of cultivated land is to lose organic matter. Virgin land covered with vegetations which is not cropped becomes richer in organic matter as plants grow and shed their leaves, branches, etc., but where plants are partially or whole removed annually and the soil is constantly cultivated, *the amount of organic matter tends to decrease*, and this particularly so in tropical and sub-tropical countries. When this reaches a stage at which the activity of soil bacteria is affected, the soil becomes less fertile, but addition of organic matter restores the lost fertility. *It improves* also the tilth, on the one hand of stiff clayey soils and on the other of sandy soils which are so light in character as to require something to enable the sand to bind, and it increases the power of the soil of retaining moisture.

Organic matter can be supplied in the form of cattle manure, fish manure, oil cakes, and other organic manures; as jungle, either that which grows on the land itself or which is cut and carried from elsewhere; or as prunings; and the practical possibility of enriching the soil in respect of organic matter by these means should receive full consideration in cases where it is required.

Under present conditions cattle manure is difficult to obtain in quantities sufficient to treat large areas of ground, while oil cakes and other organic manures do not supply sufficient organic matter to really be of much value from this point of view when a considerable addition is necessary.

When a good crop of "jungle" springs up naturally after each round of hoeing and is buried in by the next round, this obviously affords a valuable means of adding organic matter to the soil. On gardens which are fortunate enough to be well supplied with labour the mistake is sometimes made of hoeing too frequently, with the result that practically no jungle is permitted to grow. This would be very well if the land were hoed with the object of keeping down jungle in order that a suitable green crop might grow instead, but it is usually done not with this purpose in view but because the opinion exists that hoeing cannot be over-done. This is a mistake. Consequently on such gardens the excessive cultivation tends to exhaust the soil rapidly and the estate is living on its capital.

The jungle bordering cultivated areas and that growing on the sides of nullahs and on tilas varies in character according to the nature of the soil and climate and often affords material which might probably be used for the same purpose. Suitable jungle often grows in nullahs in many gardens. While plantains and similar large-leaved plants too, often grow in, and bordering on, the tea area of gardens. In this connection also attention may be drawn to the weed *Eupatorium odoratum* (see the note on this plant in the present issue) and to the *Artemizia* so common in the neighbourhood of Darjeeling gardens both of which might profitably be used in this way.

(*b*) The second aim of green manuring is to enrich the soil in respect of nitrogen. Only certain leguminous plants are capable of doing this, for they alone have the root nodules which harbour the species of bacteria which actually promote the fixation of nitrogen. Consequently serving as they do a double purpose, that of supplying organic matter and nitrogen, leguminous plants chiefly are used as green crops. There is no reason, however, why other crops should not be used and in some cases it may be desirable to grow them. The nitrogen which a soil acquires by the growth of a leguminous green crop is not fixed in amount and depends upon other things beside the actual weight and composition of the crop, for it must be remembered that the total nitrogen in the crop is the sum of that which is taken from the soil by the roots and of the atmospheric nitrogen which is fixed by the bacteria of the root nodules, and the proportions of the whole supplied from each source is not constant. If the soil contains so large a supply of available nitrogen that the plant can flourish without fixation of atmospheric nitrogen the root nodule bacteria become inoperative, and the nodules are few and small, yet the crop may be good. If on the other hand the soil is poor in nitrogen but is rich in other respects, large nodules develop, and the ultimate addition of atmospheric nitrogen to the soil may be considerable though the crop may be poorer than in the above instance. In some cases, however, the soil may be too poor to provide other constituents necessary to the plant such as potash, phosphates, etc., and a poor crop only is obtained and no opportunity is afforded of enriching the soil to any extent in respect of nitrogen.

An excellent opportunity is here afforded for the skilful use of manures. Treating the soil with a manure containing potash or phosphates and no nitrogen for the purpose of enriching the soil in respect of nitrogen may be a new idea to many, particularly to those whose only idea of manuring is to apply periodically the amount of nitrogen, phosphoric acid and potash which they calculate has been removed by the bushes since the previous application but the manuring of green crops and especially of such as are leguminous is an extremely sound method of promoting fertility of the soil.

As we have said above it is often the case that a soil is so poor in organic matter and its fertility so reduced that green manures will not grow, and often when we have had occasion to enquire whether green manuring has been carried out on gardens we have been informed that attempts to do so have ended in failure, though in many cases the desirability of replenishing the supply of organic matter has been fully recognised—in fact the failure of the green crop itself points to the infertile condition of the soil.

In such cases manuring of the green crop should be carried out. A two-fold benefit is derived from the use of artificial manures in conjunction with green crops. In the first place the growth of the latter is assisted and if it be a leguminous crop the fixation of nitrogen is also affected favourably if the manures used supply readily available potash and phosphates. There is also the reciprocal action of the green crop on the manure. The growth of a green crop tends to accelerate the decomposition of certain manures such as basic slag, bones, etc., and it is, therefore, an advantage to grow a green crop on the land on which such manures are being used. The plant takes up a certain percentage of the material provided by the manure, and when the crop is hoed in, this again becomes available to the bush within a short time. When soluable manures are applied to a green crop the latter makes use of them, returning them to the soil again as it decomposes and thus preventing the waste which would occur if soluble manures had been employed without a green crop, when they would have run a great risk of being removed by rain. The net result, therefore, of manuring in this way is to produce a heavier crop and in the case of leguminous crops to promote a greater fixation of nitrogen. It also has the result that the availability of both soluble and insoluble manures is increased.

The actual choice of manures for this purpose should depend upon circumstances. If the production of a large amount of organic matter or of fixation of nitrogen be of the greatest importance, the manures should be chosen entirely to promote the production of a big crop. In the first instance nitrogenous manures in general should be applied, for they produce rapid growths of tissue and development of shoots and leaves. Consequently a bigger crop is obtained though other manures should also be used if the particular soil is known to require them. An example in illustration of the use of manures to promote fixation of nitrogen was afforded at Heeleaka where a noticeable increase in a crop of *mati-kalai* was effected by the addition of potash to a mixture of manures. The efficacy of potash for this purpose has been observed in many countries, under many conditions, and in the case of different crops.

If on the other hand an all-round scheme of treatment of the tea is being taken in hand including the use of manures, and occasional growth of a green crop, the manures could be chosen without reference to the requirements of the green crop, but advantage should be taken of their application to grow a green crop in conjunction with them.

The series of articles of which this is the first will deal with particular green crops in addition to discussing in further detail the general subject of green manuring."—*The Indian Tea Association, Scientific Department.*

GOVERNMENT NOTIFICATION.

International Association of Tropical Agriculture and Colonial Development.

FORMATION OF A BRITISH SECTION.

We have received from the Director of Agriculture, Madras, the following notification which may interest our readers:--

"The International Association of Tropical Agriculture and Colonial Development was founded at the close of the first International Congress of Tropical Agriculture held in Paris in 1905.

The object of the Association is the promotion of the scientific and practical study of all questions connected with tropical agriculture and the development and utilisation of the natural resources of the Colonies. The President of the Association is Professor Wyndham Dunstan, M.A., LL.D., F.R.S., Director of the Imperial Institute, who was elected at the close of the International Congress, held in Brussels in May, 1910. The Association has its headquarters in Paris and is governed by an International Board, from which an Executive Committee of from five to seven administrators is selected.

The work of the Association is to promote investigation into questions of special importance to tropical agriculture, to publish the results of these enquiries, and to organise International Congresses for the discussion of the problems of Tropical Agriculture and Colonial Development. Two Congresses have ben held already and it is proposed to hold the third Congress in London in 1914.

A British Section of the International Association has now been formed, which will be responsible for the organisation of the Congress in London.

The work of the Association is not only of interest to departments of agriculture and forestry but also to planters and to merchants and manufacturers who are concerned with tropical and colonial raw materials, and it is hoped that all those interested in these important subjects throughout the Empire will join the British Section of the International Association.

The annual subscription for members of the British Section of the International Association is one pound, payable on the 1st January in each year.

Members of the British Section will have the privilege of taking part in the London Congress without further special payment. They will also receive all the publications of the International Association. In addition, the quarterly "Bulletin of the Imperial Institute" will be issued to them free of charge. A Reading and Writing Room will be reserved at the Imperial Institute for the use of members of the section when in London, and members will also be entitled to make use of the General Library and Reading Room of the Imperial Institute.

Subscriptions may be paid by crossed cheque or money order, payable to the Secretary, International Association of Tropical Agriculture and Colonial Development, British Section, and, in the case of money orders, should be drawn on the General Post Office, London.

Letters and subscriptions should be addressed to The Secretary, "British Section, International Association of Tropical Agriculture and Colonial Development," Imperial Institute London, S. W.,"

RUBBER.

(February 1, 1913)

A Boston Chemist on Synthetic Rubber

We have from time to time published articles on the question of Synthetic Rubber. Now we publish the *opinion of a Boston Chemist of* standing, who, though he believes that synthetic rubber is bound to arrive, believes also its competition will affect those now growing the natural rubber.

"Like most discussions that arise over the advance of science along the border-land which divides the known from the unknown, where the battle of progress continually rages, the discussion of the problem of synthetic rubber has its flood and its ebb, sometimes engrossing the attention of the scientific world, and sometimes lapsing into a condition of profound quiet. This has been the situation ever since Sir William Tilden, over thirty years ago, made the discovery that rubber could be made out of isoprene.

The synthetic discussion was renewed with great vigour last year by the disclosures made by Professor Perkin, of Manchester, England, in an address given before a body of scientists, showing what marked progress had been made in the solution of this problem by a group of English chemists on one hand, and another group of German chemists, both working independently and both arriving simultaneously at practically the same conclusion.

Dr. Lothan E. Weber, a Boston chemist of recognized authority in rubber circles, contributed a very interesting paper on this subject to the discussions held at the third International Rubber Conference which took place in New York last September. This paper is produced in full in this issue. Dr. Weber views the situation judicially and dispassionately. He is not disposed to join the chorus of chemists who proclaim that natural rubber—whether from the wilds of the Amazon or from the cultivated plantations of the East—will soon be given its *quietus* by the worker in the laboratory. He recognizes the great triumph of the chemical researches, in being able to produce rubber as good as comes from the South American forests, but he does not believe that they will be able—for years to come at least—to produce it on a scale that will seriously compete with natural rubber. He combats the theory of those who argue from the success of synthetic indigo to the success of synthetic rubber, showing that the two problems are totally different; stating that, while the producers of synthetic indigo had a perfectly definite task set before them, the composition of indigo being uniform and recognized, producers of synthetic rubber are compelled to work more or less in the dark, because the process of polymerization has not yet been brought under chemical control and is seriously lacking in uniformity; and he contends that synthetic rubber in commercial quantities will not be possible until the polymerization of isoprene is much more clearly understood than it is at present. While he thinks commercial synthetic rubber a *possibility of the future, he does not believe that anyone* now engaged in the rubber industry will see synthetic rubber in open competition with the natural product.

Of course, the exact time when synthetic rubber will arrive at a commercial basis is only a matter of conjecture, but many competent observers will be greatly surprised if it does not do so within the lifetime of those now engaged in rubber activities. With the tremendous advances made in the solution of this problem during the last three or four years, it does not seem possible that its final success can be many years away.— *The India Rubber World.*

Effect of Tapping upon the Composition of Rubber.

Recently, samples of rubber prepared by different methods by the Ceylon Agricultural Department, have been sent to the Imperial Institute for examination, and the present article is based upon an account of this examination which appears in the *Bulletin of the Imperial Institute*, Vol. X. No. 3.

The tapping of the trees was performed (1) by the knife only (excision), (2) by the pricker only (incision), and (3) by a combined method, using both knife and pricker.

In the first series of experiments, the first specimen consisted of Pará crepe obtained by the use of the knife only, V and half spiral cuts being made. This rubber was light brown in colour and exhibited good elasticity and tenacity. It contained 94 per cent. of caoutchouc and a relatively low percentage of ash. It was valued in London at 4s. 6d. per lb. with fine hard Pará at 4s. 3d. per lb.

The second sample was Pará crepe obtained by V and half-spiral cuts with Bowman-Northway knife and pricker. This was thin crepe rubber varying in colour from light to dark-brown. The rubber exhibited very good elasticity and tenacity. It contained 94 per cent. of caoutchouc and relatively high percentage of ash. It was valued at the same price as the first sample.

The third was Pará crepe obtained by vertical cuts and Kelway Bamber's pricker. This was dark-brown, thin, crepe rubber, which was apparently not quite as strong as the two preceding specimens.

All the samples especially No. 3 prepared by making vertical cuts, were rather dark in colour for plantation crepe.

Specimen No. 4 of the second series consisted of rubber biscuits from trees tapped with the knife only. These were thin, light-coloured biscuits, clean and well prepared, but showing white surface marks. The elasticity and tenacity of the rubber were very good. It contained 91'6 per cent. of *caoutchouc*, and the amounts of resin, protein, and ash were somewhat high.

Sample No. 5 consisted of rubber biscuits from trees tapped with Bamber's pricker: thin light-brown biscuits, clean and well prepared; a few of the biscuits showed white surface marks. The physical properties of the rubber were very satisfactory. As regards composition this sample contained 92'1 per cent. of *caoutchouc* with rather high percentages of resin, protein, and ash, though the loss on washing was considerably lower than in the case of sample No. 4.

These two samples were valued at about 4s. 11d. per lb. in London, with fine hard Pará at 4s. 8*d*. per lb.

Following on the above information in the account already referred to, is a description of a chemical examination of rubber from *Manihot dichotoma*. This has been said to be superior to *M. Glaziovii*, the well-known Ceará rubber tree, as a source of commercial rubber. Recently some trees of *M. dichotoma* were tapped for the first time. The sample sent to the Imperial Institute consisted of four pieces of dark-brown, thick crepe rubber. Two of the pieces exhibited fairly good physical properties, but the other two were soft, sticky, and very weak. Rubber represented by the two best pieces of this sample would probably realize about 4s per lb. in London, with fine hard Pará at 4s. 3d. per lb. The rubber contained 84'6 per cent. of *caoutchouc*, and the percentages of resin, protein and ash were relatively high.

It is believed that this rubber was obtained from very young treees, and that the product may improve as the trees increase in age.—*The Agricultural News*.

TEA.

Economics of the Tea Trade.

The following lecture was delivered by Dr. Chandler on the Economics of the Tea Trade.

Dr. Chandler, at the outset, remarked that it was not his purpose to deal with matters relating to cultivation and manufacture in such detail as would interest planters only, but rather to discuss, so for as he was able, the general scientific principles which underlay the various processes, because they were obviously of fundamental importance to the planter, and therefore to the trade. There was quite good reason for believing that tea, in the first instance, was not used by the Chinese as a beverage so much as a medicine, valued, first of all, for its general stimulating qualities, and secondly for its value in treating certain disorders. Even in the second stage of the evolution of tea they found that the leaf prepared by special methods served virtually as a vegetable, as it did at the present day in Burma and the Shan States. It was not until the Chinese recognised the possibility of tea as a beverage that the cultivation of the plant in China became extensive, and that tea, as they knew it, came into existence. People qualified to inform stated that repeated reference in Chinese literature showed that tea cultivation was carried on at quite an early date on an extensive scale, and although if China was not the home of the tea plant, there was very good reason for supposing that it was the home of tea cultivation. It was commonly stated that China, with her enormous tea-drinking population, probably still remained and must remain, the greatest tea producing country in the world, in spite of the remarkable developments elsewhere; but as there were positively no statistics upon which to base that statement, it would be quite useless to discuss the probabilities either for or against.

Turning to the practical, or what might be called the purely commercial side of the question, the total world's production of tea in 1912 amounted to 730,000,000 lbs., valued at approximately £18,200,000. The distribution of that enormous quantity to the tea principally tea consuming countries showed a per capital consumption of about 3 lbs. per head. The most recent official return of the tea consumption per head in the tea-consuming countries of the world was a White Paper issued by the Board of Trade in 1911, and which contained a most interesting summary of tea statistics. It was then estimated that the average world's consumption per head was about 2·73 lbs., but he had since been able to obtain further statistics which tended to raise that average in connection with which there were some noteworthy points. In the report of the Indian Tea Association for 1911-12 the following particulars were given: New Zealand, 7·4 lbs; Canada, 4·3 lbs.; Holland, 2·1 lbs. South Africa, 1·2 lbs; Belgium (1911), 0.22 lbs.; Denmark, 0·9 lbs.; Germany, 0·1 lb. France, 0·7 lbs.; British Empire (excluding South Africa), 6·2 lbs.; English-speaking countries, 5·16 lbs. other countries, 0·63 lbs. The first point he wished to call attention to was the predominance of the British peoples as tea drinkers. Their consumption was tenfold that of foreign countries, *viz.*, 6·2 lbs. yer head, as compared with 0·63 lbs., excluding United States. Analysing the British figures, it was to be noted that New Zealand had headed the list, with a consumption 7·4 lbs. per head, and South Africa was last with 1·2 lbs. Holland headed the list of the continental tea-drinking countries, which was in part explained by the fact that she possessed a tea-producing colony in the East Indies. It was a matter for great surprise that

Russia, which was commonly supposed to be a great tea-consuming nation, only consumed 1 lb. per head per annum. Great tea drinkers they were, but they were certainly not great tea consumers, except among the upper classes, which was due to the relative poverty of the great mass of the people. In the case of the latter, the tea was first of all taken very weak and the leaves were used over again, hence the amount consumed was not great. It was a remarkable fact, well known to the India, Ceylon and Chines growers that exports to Russia largely depended upon the Russian harvest; good harvests meant large imports of tea. Nevertheless, the Russian market was a most valuable one, on account of its immense population, and was eagerly sought after by more than one tea-producing country. In the United States the consumption per head was slowly but steadily rising. Germany was not a tea-drinking country, and France was still less so. The consumption of tea in the United Kingdom in 1912 was estimated at 293,500,000 lbs.; Russia, 148,597,000 lbs; United States, 102,654,000 lbs.; Canada, 38,000,000 lbs.; Australia, 34,000,000 lbs.: the lowest amount recorded being that of Denmark, which was 1,069,000 lbs. It had been estimated that every year the natural increase in the demand for tea would necessitate the annual planting up of something like 20,000 acres, which was an impossibility, owing to the scarcity and high cost of labour in the tea-growing countries, and the extra demand was in a large measure met by increasing the productivity of existing gardens.

History and Development.

Dr. Chandler then briefly traced the history and development of the tea industry from the year 1800 up to 1912, and then proceeded to discuss the question of cultivation and manufacture. He said that there was no need to emphasise the importance of a thorough knowledge of the scientific principles underlying the methods of any industry, whether agricultural or not; but he might be permitted to remark that there were few agricultural industries in which such a knowledge was more necessary than in the case of tea. This was abundantly proved by the success of the Indian and Ceylon industries, at the expense of the Chinese, so far as external markets were concerned, and in regard to the Indian industry, it was freely admitted that the Indian Government and the planting community generally would have been saved vast expense had they had a better knowledge of the botany of the tea plant earlier. It had been stated that much of the disasters which overtook the Indian Industry in its early years was to be attributed to the improper and rule-of-thumb methods, both in cultivation and manufactue. It was, therefore, desirable that one should have a good grasp of the principles upon which the various methods of cultivation and manufacture, were founded. Although what he had said was quite true in regard to the past history of the Indian tea trade, one must be, however, quick in adding that quite remarkable knowledge and forethought were exhibited at the present time in the tea industry, whether in India, Ceylon, or Java. Both Ceylon and Java, to a very large extent were benefitting from the experience of India, and the work done both by and for the Indian planter came out in the fact that, whereas in 1873 the average yield per acre of tea in Assam was about 270 lbs., at the present time the average yield was in the neighbourhood of 500 lbs. per acre, while the tea produced was of a better quality; so that an enormous amount of scientific work, whether consciously or unconsciously, must have been done. In this connection one must pay a tribute to the Indian Tea Association, which had worked both scientifically and commercially in its endeavours to improve the quality of tea wherever it was grown.—*Home and Colonial Mail.—The Indian Planters' Gazette and Sporting News.*